

CUMBERLAND RIVER BOARD

Twelfth

Annual Report

for the

Year ended the 31st March, 1963

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Chairman of the Board:

Major EDWIN THOMPSON, O.B.E., F.L.A.S.

Vice-Chairman:

Major CHARLES SPENCER RICHARD GRAHAM

RIVER BOARD HOUSE,
LONDON ROAD, CARLISLE, CUMBERLAND.
TELEPHONE CARLISLE 25151/2

NOTE

The Cumberland River Board Area was defined by the Cumberland River Board Area Order, 1950, (S.I. 1950, No. 1881) made on 26th October, 1950. The Cumberland River Board was constituted by the Cumberland River Board Constitution Order, 1951, (S.I. 1951, No. 30). The appointed day on which the Board became responsible for the exercise of the functions under the River Boards Act, 1948, was 1st April, 1951.

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PART I

GENERAL

Chairman of the Board :

Major EDWIN THOMPSON, O.B.E., F.L.A.S.

Vice-Chairman :

Major CHARLES SPENCER RICHARD GRAHAM.

Members of the Board :

- (a) Appointed by the Minister of Agriculture, Fisheries and Food and by the Minister of Housing and Local Government.

Wilfrid Hubert Wace Roberts, Esq., J.P. Desoglin, West Hall, Brampton, Cumb.

- (b) Appointed by the Minister of Agriculture, Fisheries and Food to represent :

- (i) Drainage Boards and that portion of the River Board Area for which Drainage Boards might be, but have not been, established.

Joseph Jackson Bell, Esq., O.B.E., A.R.I.C.S., M.R.S.H.	Roewath, Raughton Head, Carlisle.
Major Charles Spencer Richard Graham	Crofthead, Longtown, Cumberland.
Derek Armstrong Pattinson, Esq., F.R.I.C.S., F.L.A.S.	Estate Office, Lowther, Penrith, Cumb.
John Hodgson Read, Esq. 	Holme House, Wetheral, Carlisle.
John Rowntree Slack, Esq. 	Mealo House, Allonby, Maryport, Cumb.
Major Edwin Thompson, O.B.E., F.L.A.S.	Market Place, Keswick, Cumberland.
James Westoll, Esq., J.P. 	Dykeside, Longtown, Cumberland.

(ii) Fishery Interests

J. P. Hayton, Esq. 	13, Greengarth, Great Clifton, Workington, Cumberland.
Sir Gerald G. Ley, Bt., T.D. 	Lazonby Hall, Penrith, Cumberland.
Peter John Liddell, Esq., D.S.C., M.A., F.Inst.D.	Moorhouse Hall, Warwick-on-Eden, Carlisle.
William W. Routledge, Esq., F.C.A. ...	"Knightstone", 24, Brampton Road, Carlisle.
E. H. Fleming Smith, Esq., T.D., F.R.I.C.S., F.L.A.S.	Hawksdale Hall, Dalston, Carlisle.
John Topping Stafford, Esq. 	The Cottage, Bowness-on-Solway, Kirkbride, Carlisle.
J. L. Wilson, Esq. 	1, Old Smithfield, Egremont, Cumb.
William Wilson, Esq., M.B.E. 	"Cuilfail", Gosforth, Seascale, Cumb.

Appointed by the County Council of Cumberland

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|--|--|
| J. Askew, Esq.
(Resigned November, 1962) | 31, Ashfield Road, Workington, Cumb. |
| (f) T. M. Brough, Esq. | The Bungalow, Port Carlisle, Carlisle. |
| (g) Sir Charles Owen Butler, K.B.E., ...
C.M.G., E.D. | "Crossways", Beacon Edge, Penrith. |
| Joseph Coulthard, Esq., A.R.I.C.S. | Mill Ellers, Dalston, Carlisle. |
| (c) George W. Davidson, Esq.
(Died January, 1963) | 45, Scotch Street, Carlisle. |
| F. Dempster, Esq.
(Appointed December, 1962) | 11, Greengarth, Great Clifton, Workington, Cumberland. |
| (d) J. Downes, Esq. | "White Ash", Lorton, Cockermouth, Cumberland. |
| Commander Frederick Middleton
Fox, O.B.E., A.F.C., V.R.D.,
R.N.V.R. (Ret.) | Fawe Park, Keswick, Cumberland. |
| Nigel F. Hudleston, Esq. | Hutton John, Dacre, Penrith Cumb. |
| (c) W. Jackson, Esq. | Greensyke, Houghton, Carlisle. |
| Captain Llewellyn Evan Hugh ...
Llewellyn, C.B., O.B.E., D.L., R.N. | "Glenwood", Ravenglass, Cumberland. |
| J. Lowther, Esq. | The Grove, Kirkbride, Carlisle. |
| (a) Isaac Park, Esq.
(Appointed November, 1962) | 102, George Street, Whitehaven, Cumb. |
| (e) Thomas J. Rawling, Esq. | "Overdale", Linethwaite, Moor Row, Cumberland. |
| (a) W. Stephenson, Esq.
(Resigned July, 1962) | 44, The Gardens, Whitehaven, Cumb. |
| (b) Robert Townsley, Esq. | 12, Roper Terrace, Salterbeck, Workington, Cumberland. |
| (b) William Armstrong Walker, Esq.,
J.P. | Croft House, Elizabeth Street, Workington, Cumberland. |
| William Walker, Esq., J.P. ...
(Appointed May, 1962) | Greenlands, Holmrook, Cumberland. |
| (c) Stanley Walton, Esq.
(Appointed March, 1963) | The Hill, Gilsland, Carlisle. |
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| (a) | Nominated by Whitehaven Borough Council. |
| (b) | " " Workington Borough Council. |
| (c) | " " Border Rural District Council. |
| (d) | " " Cockermouth Rural District Council. |
| (e) | " " Ennerdale Rural District Council. |
| (f) | " " Wigton Rural District Council. |
| (g) | " " Penrith Urban District Council. |

Appointed by the County Council of Westmorland

Captain The Hon. Anthony George Lowther, M.B.E. (Appointed April, 1962).	Whitbysteads, Askham, Penrith, Cumb.
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Appointed by the County Borough Council of Carlisle.

Leonard Birtles, Esq.	10, Beck Road, Belle Vue, Carlisle.
Archibald Harry Gladstone Boggis, Esq.	10, Scotland Road, Carlisle.
Irving Burrow, Esq.	31, Lamb Street, Upperby, Carlisle.
Ritson Graham, Esq., J.P.	24, Buchanan Road, Currock, Carlisle.
Richard Dennis Harrison, Esq. ...	"Eden Lea", Millcroft, Brampton Road, Carlisle.
Captain Clement Norman Matthews, M.B.E., J.P.	Little Bank, Stanwix, Carlisle.
Bernard Cook McCaffrey, Esq. ... (To October, 1962)	31, Sheehan Crescent, Raffles, Carlisle.
T. H. Phillips, Esq. (Appointed November, 1962)	86, Creighton Avenue, Raffles, Carlisle.

It is with deep regret that the Board records the death of Mr. G. W. Davidson in January, 1963. Mr. Davidson had been a member of the Board from February, 1958.

COMMITTEES

FINANCE AND GENERAL PURPOSES COMMITTEE

Chairman :

Wilfrid H. W. Roberts, Esq.

Vice-Chairman :

Ritson Graham, Esq.

A. H. G. Boggis, Esq.

Sir Owen Butler.

J. Coulthard, Esq.

Commander F. M. Fox.

N. F. Hudleston, Esq.

W. Jackson, Esq.

P. J. Liddell, Esq.

Capt. The Hon. A. G. Lowther.
(Appointed April, 1962)

Captain C. N. Matthews.

D. A. Pattinson, Esq.

T. J. Rawling, Esq.

J. H. Read, Esq.

W. W. Routledge, Esq.

J. R. Slack, Esq.

E. H. Fleming Smith, Esq.

R. Townsley, Esq.

W. A. Walker, Esq.

J. Westoll, Esq.

W. Wilson, Esq.

The Chairman and Vice-Chairman of the Board, and the Chairman of each of the Divisional Committees (ex-officio).

EASTERN DIVISIONAL COMMITTEE

Chairman :

Major C. S. R. Graham.

Vice-Chairman :

Peter J. Liddell, Esq.

J. J. Bell, Esq.

L. Birtles, Esq.

A. H. G. Boggis, Esq.

T. M. Brough, Esq.

I. Burrow, Esq.

Sir Owen Butler.

J. Coulthard, Esq.

G. W. Davidson, Esq.
(Died January, 1963)

R. Graham, Esq.

R. D. Harrison, Esq.

N. F. Hudleston, Esq.

W. Jackson, Esq.

Sir Gerald Q. Ley, Bo.

Capt. The Hon. A. G. Lowther
(Appointed April, 1962)

Capt. C. N. Matthews.

B. C. McCaffrey, Esq.
(To October, 1962)

D. A. Pattinson, Esq.

T. H. Phillips, Esq.
(Appointed November, 1962)

J. H. Read, Esq.

W. W. Routledge, Esq.

J. T. Stafford, Esq.

S. Walton, Esq.
(Appointed March, 1963)

J. Westoll, Esq.

Co-opted Members

The Lord Henley	...	...	...	Scaleby Castle, Carlisle.
Oscar George, Esq.	...	...	...	"Green Bank", Brough Sowerby, Kirkby Stephen, Westmorland.
R. T. W. Hewetson, Esq.	...	...	...	Stobars, Kirkby Stephen, Westmorland.
Capt. J. G. Milne Home	...	...	...	Buccleuch Estates, Ltd., Irvine House, Canonbie, Dumfriesshire.
Maj. Gen. Sir G. Johnson, K.C.V.O., C.B., C.B.E., D.S.O.				Castlesteads House, Brampton, Cumb.
W. H. Lawson, Esq.	...	...	...	Corby Castle, Carlisle.
S. C. Mathison, Esq.	...	...	...	1, Norfolk Road, Carlisle.
D. J. Thornton, Esq.	...	...	...	Old School House, Bampton Grange, Penrith, Cumberland.

The Chairman and Vice-Chairman of the Board, and the Chairman of the Finance & General Purposes Committee (ex-officio).

WESTERN DIVISIONAL COMMITTEE

Chairman :

Major Edwin Thompson.

Vice-Chairman :

John R. Slack, Esq.

J. Askew, Esq. ... (Resigned October, 1962)	I. Park, Esq. (Appointed November, 1962).
T. M. Brough, Esq.	E. H. Fleming Smith, Esq.
F. Dempster, Esq. (Appointed December, 1962)	W. Stephenson, Esq. (Resigned July, 1962)
J. Downes, Esq.	R. Townsley, Esq.
Commander F. M. Fox	W. A. Walker, Esq.
J. P. Hayton, Esq.	W. Walker, Esq. (Appointed May, 1962)
Captain L. E. H. Llewellyn.	J. L. Wilson, Esq.
J. Lowther, Esq.	W. Wilson, Esq.
Captain C. N. Matthews.	
T. J. Rawling, Esq.	

Co-opted Members

J. Baird, Esq.	Wampool, Kirkbride, Carlisle.
T. W. Pears, Esq.	Wood Farm, Thursby, Carlisle.
J. A. Reddie, Esq., F.R.I.C., F.R.M.S.	Lodore Hotel, Borrowdale, Keswick, Cumberland.
R. J. W. Slack, Esq.	Hartlow, Silloth, Cumberland.
The Chairman and Vice-Chairman of the Board, and the Chairman of the Finance & General Purposes Committee (ex-officio).	

PART II

PARTICULARS OF STAFF

(as at 31st March, 1963)

(1) CHIEF OFFICERS

Clerk of the Board and Financial Officer	RALPH BIRKETT, F.C.C.S.
Chief Engineer and Pollution Prevention Officer	A. J. COLLINS, B.Sc., A.M.I.C.E., A.M.I.W.E.

(2) OTHER OFFICERS

CLERK'S DEPARTMENT

1 Deputy Clerk and Financial Officer	A.P.T. IV
1 Rating Assistant	Clerical Division Grade III
1 Accountancy Assistant	do.
1 Rate Collector and Clerical Assistant	General Division
2 Shorthand Typists	Shorthand Typists' Scale
2 Junior Clerks (vacant)	General Division

ENGINEER'S DEPARTMENT

1 Deputy Engineer	Outside A.P.T. Grades
3 Assistant Engineers	A.P.T. III
1 Surveying Assistant	Miscellaneous IV
1 Assistant Pollution Prevention Officer	A.P.T. III
2 Clerks	General Division

(3) WATER BAILIFFS

- 2 Divisional Fisheries Inspectors (Full-time).
- 13 Water Bailiffs (Full-time).
- 31 Honorary Bailiffs (unpaid).

(4) LABOUR FORCE

- 47 Workmen.

PART III

INFORMATION AS TO WATER RESOURCES

SECTION 1. RAINFALL.

The Board maintains rainfall gauges at the following places :—

<i>Catchment</i>	<i>Station</i>	<i>National Grid Reference</i>
Eden	Lamperts, Gilsland	NY(35)683746
	Renwick	NY(35)598433
	Skelton B.B.C.	NY(35)428373
	Patterdale Hall	NY(35)390163
	Temple Sowerby	NY(35)609273
	Appleby Castle	NY(35)684198
	Mallerstang	NY(35)783008
Esk (Border)	Longtown C.A.D.	NY(35)353668
Irt	Wasdale Head	NY(35)186089
—	Anthorn V.L.F.	NY(35)183586
(From 24th March, 1963)		

Regular observations have been kept at all these stations with the exception of Lamperts. Records are sent to the Meteorological Office and are published in "British Rainfall".

Rainfall records have also been supplied to the Board by observers at :—
 Newton Rigg Farm School, Penrith.
 Hutton John, Penrith.

All these records are kept at the Board's Head Office. A map of the River Board Area showing the distribution of rainfall is supplied monthly by the Meteorological Office.

SECTION 2. CHARACTERISTICS OF RIVERS AND STREAMS.

At the end of March 1963 there were five primary gauging stations completed and recording river flows :—

<i>River</i>	<i>Location</i>	<i>National Grid Reference</i>
Eden	Warwick Bridge	NY(35)471567
Derwent	Camerton	NY(35)037305
Eamont	Udford	NY(35)575305
Esk (Border)	Netherby	NY(35)390718
Lowther	Eamont Bridge	NY(35)525285

All these stations consist of a level recorder giving a continuous record together with provision for current meter observations. Progress has been made at each of these stations in the building up of stage discharge curves.

It is expected that records from the Board's Primary Gauging Stations on the River Derwent at Camerton and on the River Eamont at Udford will be published for the first time in the "Surface Water Year Book of Great Britain" 1961/1962.

The Board has continued to service the two water level recorders installed on Lake Ullswater by the Manchester Corporation. These are continuous level recorders and the charts are kept at River Board House.

There have been regular daily readings of water level of Bassenthwaite Lake, of the River Eden at Warwick Hall and at Willow Holme, Carlisle, and of the River Cocker at Cockermouth.

An automatic temperature recorder has been used to provide a record of the temperature of the River Eden at the North British Bridge, Carlisle.

All these records are kept at the Board's Head Office.

SECTION 3. GAUGING BY PERSONS OTHER THAN THE BOARD.

Records of flow have been maintained by Manchester Corporation at the following two stations :—

<i>River</i>	<i>Location</i>	<i>National Grid Reference</i>
Greta (St. John's Beck)	Thirlmere	NY(35)309191
Lowther (Haweswater Beck)	Thornthwaite, Haweswater.	NY(35)515161

Records of these gaugings are returned through the Board to the Surface Water Survey, and are published in the "Surface Water Year Book of Great Britain".

SECTION 4. OTHER HYDROLOGICAL OBSERVATIONS.

There is nothing that can be reported as to other hydrological observations, and not included in Sections 2 and 3.

SECTION 5. ABSTRACTION OF WATER.

The most important matter which the Board has had to consider during the year in connection with the abstraction of water was the possible further demand for water from the Board's area by the Corporation of Manchester and other authorities in the North West of England. The Board was represented on the Conference on Water Resources in the North West of which Earl Jellicoe was Chairman. A number of meetings of the Conference were held during the year and a final report was made in February 1963 by Earl Jellicoe to the Minister of Housing & Local Government. This report included a report of the Technical Committee of the Conference on which the Board was represented by its Consulting Engineer, R. H. Cuthbertson, Esq., M.I.C.E.

Carlisle Corporation brought into use their new intake in the River Eden at Wetheral but, because of the comparatively wet year, it was not necessary to draw any substantial amount from this new source.

There has not been any material extension of the taking of water from the rivers for land irrigation.

No further action was taken during the year by the Board under Sections 9(3) and 9(8) of the River Boards' Act 1948 to obtain information as to abstractions of water.

SECTION 6. GENERAL REVIEW.

The twelve months record of rainfall shows alternating wet and dry periods during the summer of 1962 followed by a dry autumn and a very cold winter with much less than average precipitation. The second half of March 1963 was wet, April 1962 was generally wet and August 1962 was very wet. The rainfall for the twelve months was less than average. Severe floods were experienced in the Central Lakeland Area on August 11th 1962, when considerable damage occurred at Seathwaite and Rosthwaite and down the River Esk. There was also flooding in the Eden Valley on April 3rd, 1962.

The exceptionally cold winter did not produce the depth of snow over a large area that was experienced in many other parts of England, but was very considerable on higher ground. The duration of the cold weather was however, unusually long. The thaw together with rain on March 5th and 6th resulted in bank full rivers but not very much flooding.

PART IV

LAND DRAINAGE

SECTION 1. CAPITAL WORKS.

(i) PROGRESS ON NEW WORKS.

(a) RIVER PETTERIL (CARLISLE) IMPROVEMENT SCHEME.

This improvement of the River Petteril consists of a new channel 2,330 feet long and improvement of a length of existing channel and includes the construction of cascades and a new footbridge together with the diversion of certain lengths of sewers. The main work had all been completed by the 31st March, 1962, but there had been considerable damage by floods in the previous winter. The repair of this flood damage was completed in the summer of 1962. The total cost was £27,182.

(b) RIVER LYVENNET — MAULDS MEABURN, WESTMORLAND.

This scheme for the improvement of a length of the River Lyvennet was estimated to cost £2,150, but bad site conditions because of weather and flooding caused delays and extra expenditure. The work was finally completed in June 1962, the total cost being £2,889.

(c) RIVER WAVER — (LESSONHALL) IMPROVEMENT SCHEME.

This grant-aided improvement of a length of the River Waver downstream of Lessonhall is estimated to cost £7,000. The work comprises the widening and regrading of a length of the river ; a particular difficulty is the nearness of a highway over almost the whole of the length. Very good progress was made during the summer of 1962 but floods in August caused a considerable amount of damage. Most of this damage was speedily made good and work proceeded steadily until all work was stopped by extreme cold in January 1963, a resumption not being possible until March. By the 31st March, 1963, expenditure had reached £7,483, the over-expenditure being all caused by the repair of flood damage. By that date the whole of the work was approaching completion.

(d) RIVER EDEN (BOLTON WILLOWS) IMPROVEMENT SCHEME.

This scheme comprises the improvement of a short length of the River Eden in Westmorland, and about five miles north-west of Appleby, by the removal of gravel shoals and re-alignment. It is designed to remove the danger of flooding to an area of useful agricultural land. The estimated cost is £3,500 and was approved for grant-aid in May 1962. Work was commenced in June 1962, but progress was rather slow because of periods of high water and particularly because of a flood in August. The work was completely stopped in the winter with a limited resumption in March. The total expenditure to 31st March 1963, was £2,931.

(e) GAUGING STATION — RIVER LOWTHER — EAMONT BRIDGE.

This gauging station has a continuous level recorder and suspension gear for a current meter. During the construction a certain amount of channel improvement was necessary to provide a uniform cross-section. The total cost was £1,112, and work was substantially complete by the 31st March, 1963.

(ii) FUTURE WORKS SCHEMES APPROVED IN PRINCIPLE.

(a) RIVER ELLEN (BRAYTON DOMAIN) IMPROVEMENT SCHEME.

This scheme, consisting of a new cut for the River Ellen near Aspatria, and estimated to cost £2,153, was approved in principle by the Board but was refused grant in aid.

(b) RIVER PETTERIL (CARLISLE) IMPROVEMENT SCHEME Part II, Stage I.

This scheme, estimated to cost £2,600, comprises the lowering of Harraby Mill Weir and the improvement of the channel upstream. The main objects of this work are to reduce flooding of the highway at Upperby and to enable a more

extensive improvement to be carried out upstream. Carlisle Corporation has promised a contribution of £250 towards the cost. The scheme was approved in principle by the Board in October 1962, and submitted to the Ministry of Agriculture, Fisheries & Food with an application for grant-aid, but no decision had been reached by March 31st 1963.

(c) RIVER CALDEW (CARLISLE) IMPROVEMENT SCHEME.

This scheme is in the Board's programme of works but has not yet been designed in detail. It covers the length of the River from the confluence with the River Eden to Holme Head Weir and is entirely within the boundaries of Carlisle.

(d) BECKFOOT BECK IMPROVEMENT SCHEME.

This scheme, through the improvement of lengths of main river, will give benefit to the drainage of about 600 acres within the Allonby Bay and River Ellen Internal Drainage District. The total cost of the scheme is estimated at £11,311. Approval in principal has been given by the Finance and General Purposes Committee and the Board has been recommended to approve the submission of the scheme to the Ministry of Agriculture, Fisheries and Food with an application for grant-aid.

(e) GAUGING STATION — RIVER EDEN — TEMPLE SOWERBY.

The Finance and General Purposes Committee has recommended the Board to approve the submission to the Ministry of Agriculture, Fisheries and Food of a scheme for the construction of a gauging station on the River Eden at Temple Sowerby with an application for grant-aid. This is an addition, recently approved by the Ministry of Housing and Local Government, to the outline gauging scheme. The gauging station will consist of a continuous level recorder together with suspension gear for a current meter.

SECTION 2. MAINTENANCE.

(a) NORTH WESTERN AREA.

1. RIVER WAMPOOL.

During June, Excavator No. 12 began the dredging of the downstream length between How Wath railway bridge and Laythes. Because of the large accumulations of silt deposited by the tides and by floods, this work is necessary at intervals of about five years. The work continued throughout the year except for a period during the winter when thick ice and hard frozen ground prevented it.

The work of widening, removal of gravel and easing of bends between Moorhouse Mill and Micklethwaite, commenced during the previous year, was completed in August.

The usual hand cleaning in the upper reaches from Curthwaite to Cardew Mires has been done during the year.

2. BAMPTON BECK AND POW BECK (NORTH).

These two tributaries of the River Wampool were cleaned by hand during the year.

3. RIVER WIZA.

Gravel accumulations near Low Wiza Bridge, Wigton, were removed by hand during the winter.

During January Excavator No. 1 began clearing gravel shoals from the channel and sloping the banks where necessary from Dockray Hall upstream.

4. RIVER WAVER.

The dredging of the channel by Excavator No. 13 near Ellercar and upstream continued during the spring but was suspended during the summer, to avoid damage to hay crops. Work was resumed in October and was completed to the outfall of Lessonhall Millstream in December. Much of the spoil excavated in the spring was spread after the hay harvest but subsequent excavated spoil had to be spread in the spring of 1963.

The channel between Lessonhall Bridge and Waver Bridge requires attention and during the winter considerable tree clearance was carried out for a short distance upstream of Lessonhall Bridge followed by easing of bends and the removal of the remains of the old Lessonhall Mill Weir.

5. LESSONHALL MILL STREAM.

This small main river carries the drainage from a considerable area of the Waver and Wampool Internal Drainage District and during the floods of August and September the left floodbank was overtopped. Excavator No. 1 raised the level of the floodbank during the early part of the winter. The usual cleaning and weed clearance was done during the year.

6. WAVERTON MILL STREAM.

The usual cleaning was done in March.

7. CRUMMOCK BECK, HOLME DUB AND LANGRIGG BECK.

The total length of these watercourses is about 11 miles, most of which was improved between 1951 and 1954. The usual annual cleaning has been done together with removal of occasional slips and repair of timber revetment where necessary.

8. CAUSEWAYHEAD BECK AND BLEA GUTTER.

Some renewal of timber revetment at the downstream end of Blea Gutter and in Causewayhead Beck downstream of Blea Gutter outfall was done during June. Blea Gutter was cleaned in July and Causewayhead Beck was cleaned during the winter.

9. SNECKYEAT BECK (SILLOTH).

This small watercourse, which discharges into the Waver estuary, was cleaned in June.

10. CROSS BECK.

An improvement scheme was carried out on this watercourse in 1959, when the channel was deepened and the banks left rather steep. Trouble had been experienced for some years with bank slips which frequently blocked the channel. In October, Excavator No. 1 began the sloping of both banks to a more stable slope.

The top of the outfall pipes was repaired in April having been damaged by the winter gales. A new outfall door was fitted in July.

11. BECKFOOT BECK, MAWBRAY BECK, JORDAN BECK, CROOKHURST BECK, MEALO BECK, BRUNSOW BECK AND SCAD BECK.

These small watercourses drain a large part of the Allonby Bay and River Ellen Internal Drainage District and all have separate outfalls, some piped, into the Solway Firth. Cleaning and general maintenance has been done on all the watercourses during the year and the outfalls of Scad Beck, Brunslow Beck and Mealo Beck have been cleared of gravel on three occasions following gales and high tides.

12. BLACK DUB.

Cleaning and weed cutting was carried out during the period August to October. Since this watercourse was improved in 1959 the growth of sedge had become prolific. Certain lengths were sprayed with Dowpon in 1961 which resulted in a very marked reduction in the growth of sedge during the year under review.

13. RIVER ELLEN.

Revetment repairs near Oughterside were carried out in July. A large erosion on the length improved in 1950, downstream of Bullgill was repaired during July. During the recent severe winter, when labour could not be employed elsewhere, the opportunity was taken to remove overhanging and derelict trees from the banks, working downstream from Dearham Bridge.

Tree and brush clearance, replacement of revetment, and removal of small gravel shoals was carried out upstream of Blennerhasset during the early part of the year.

14. EEL SYKE (MARYPORT).

The length between the railway and the main road culvert was cleaned in November.

(b) CENTRAL AREA.

1. RIVER COCKER.

The left bank, below Low Rogerscale, downstream of the point where extensive protective works were done some years ago, was breached during the August floods. The breach was repaired during September. Gorse bushes, growing on the right bank and berm downstream of Liza Beck, were cut and burned during February.

2. NEWLANDS BECK.

Bank repairs, in progress during the previous year, near Little Braithwaite were continued into August. Gravel accumulations were removed from the channel by excavator and used to raise the floodbanks between Little Braithwaite and Stair.

An erosion in the left bank at the bend upstream of Coledale Beck outfall was caused by the August flood. Revetment and bank reinstatement was carried out during November.

3. RIVER GRETA.

Accumulations of gravel in the channel from near High Hill, Keswick, to upstream of the Cumberland Pencil Co's Works were removed by Excavator No. 2 between August and September. The gravel was taken away by a firm of contractors, at their own expense, for use on a nearby road improvement scheme.

The length between the confluence with the River Derwent and Greta Bridge, Keswick, was cleared of overhanging and derelict trees during the winter.

4. RIVER GLENDERAMACKIN.

The right bank between Bridgend and Threlkeld Hall was damaged in the August flood. Repairs began in December but were not completed until March, the hard frost causing a suspension of work.

5. DUBWATH BECK.

Bank repairs on the length upstream of Embleton were carried out during September.

6. BRAITHWAITE MAIN SOUGH.

The usual cleaning and weed cutting was done during the year.

7. PARK BECK.

During February accumulated gravel was removed which was blocking the channel between Loweswater Lake and Buttermere Lake.

8. RIVER MARRON.

Accumulated gravel was removed from the channel near Asby during November and December. Removal of overhanging trees and derelict trees which had fallen in the channel was done downstream of Ullock during March.

9. GRAVEL TRAPS.

The traps at Beckthorns and Fornside at St. Johns-in-the-Vale were emptied by hand in April.

High Nook Trap near Loweswater was emptied by hand in January.

(c) SOUTH WESTERN AREA.

1. POW BECK (ST. BEES).

The annual weed cutting was done during late August. The weed, which last year was mainly water cress, was sprayed with a chemical weed killer in early July with encouraging results.

2. RIVER EHEN.

During the August flood the right bank downstream of Low Ehenside was damaged and the flood bank was in danger of being breached. The bank was repaired with building stone during October. Both banks upstream of Cleator Mills were cleared of brush.

3. RIVER KEEKLE.

Brushing of banks was done near Cleator Moor in December. Removal of gravel accumulations near Cleator Church began during February.

4. RIVER BLENG.

Scour in the right bank downstream of Sneakeat Bridge was checked by the rough tipping of pitching stone. Pitching stone was also used to repair the left bank upstream of Bleng Bridge.

5. RIVER MITE.

Brush clearance from the berms and banks was carried out during December.

6. RIVER ESK.

Repairs were done to the floodbank downstream of Hinning House during April. During May and June both banks opposite Cropple How Farm were repaired using large limestone pitching. Two gabion groynes were also constructed in the right bank to supplement four Italian type gabion groynes which were constructed in 1955, and which had suffered a certain amount of disintegration. Brush wood was cleared from both banks in this area.

Near Wha House, a short distance downstream of the main river limit, a wash out in the right bank was repaired and a gabion groyne was constructed further downstream to protect a wall built about seven years ago.

7. ESKMEALS BECK.

The annual cleaning was done during October and November.

8. RIVER ANNAS.

Cleaning of the slow flowing upstream length between Cross House and Seaton Hall, Bootle, was carried out during September.

9. MILLERGILL.

The annual cleaning and weed-cutting was done during July.

(d) EASTERN AREA.

1. RIVER EDEN.

Brushing of banks and removal of fallen trees near Warcop was carried out in January.

2. RIVER EDEN — WARWICK HOLME FLOOD EMBANKMENT.

A length of this embankment near Castle Shields had subsided since it was constructed in 1955 and was almost over-topped by the January, 1962, floods. About 200 yards of embankment was raised about 15 inches during June.

3. RIVER CALDEW.

Four gabion groynes were constructed during April to protect the right bank opposite Cummersdale Print Works.

Repair and re-instatement of banks and gabion cascades was carried out downstream of Mosedale Bridge during May but further similar work was necessary on this length following the August flood.

Bank reinstatement using pitching stone and quarry waste was done near Carrhead in November and December.

A length of retaining wall which forms the left bank of the river alongside the burial ground at Dalston, had collapsed, allegedly due to gravel workings in the channel downstream. The damage was made good by constructing a gabion toe-wall and back-filling with gravel.

4. BRUNSTOCK BECK.

The whole length of main river from Rickerby Park, Carlisle, to near Highberries was cleaned by Excavator No. 3.

5. RIVER PETTERIL.

Excavator No. 3 cleaned the length from the outfall into the River Eden to the old waterworks in September.

Derelict trees and a large gravel shoal were removed from the channel near Crook's Bridge, Wreay, in October.

6. KIRKSTONE BECK.

Three breaches, caused by the August flood, were repaired and the right bank was reinstated generally in September. A large gravel accumulation in Hartsop Beck, a tributary, was removed by bulldozer in October.

7. CROOKS BECK.

A small amount of bank reinstatement was done during May near Warcop.

SECTION 3. WORK IN INTERNAL DRAINAGE DISTRICTS ADMINISTERED BY THE BOARD.

1. WAVER & WAMPOOL INTERNAL DRAINAGE DISTRICT.

The scheduled watercourses, with a total length of about 90 miles, were cleaned and banks were repaired where necessary. All this work was done by hand labour. About 34 miles of watercourse were sprayed with chemical weed killer which resulted in a considerable reduction of time spent on weed clearance and also reduced considerably the growth of grass on the sides of the channels.

2. ALLONBY BAY & RIVER ELLEN INTERNAL DRAINAGE DISTRICT.

There are now 425 chains of scheduled watercourses in this area and all these were cleared of silt and weed during the year.

The improvement of Barney Gill, near Maryport, was completed during the summer.

3. UPPER DERWENT INTERNAL DRAINAGE DISTRICT.

Accumulated gravel was removed from Coledale Beck between the outfall into Newlands Beck and Braithwaite and extensive repairs were done to the banks on this length.

Coledale Beck gravel trap was emptied during September.

4. RIVER MARRON INTERNAL DRAINAGE DISTRICT.

Some work was done in April on the removal of accumulated gravel from Black Beck at Ullock.

5. BRUNSTOCK BECK INTERNAL DRAINAGE DISTRICT.

The usual weed cutting and cleaning was done on Whitrigg Sough, the only scheduled watercourse in this district.

SECTION 4. FLOODS.

The worst floods during the year under review occurred in August 1962. On the 11th of that month, following very heavy rain in the Central Lakeland Area, all the rivers flowing out of that area were in full flood. At Wasdale Head there was 2.08 inches of rain on the 10th followed by 5.06 inches of rain on the next day. Flooding was particularly severe in the upper Derwent with the highest water level for many years at Seathwaite and at Rosthwaite. Considerable flooding was also experienced in the River Esk Valley, and in the River Calder. The flooding was, however, of short duration and no large area was affected, but it did cause trouble in a number of houses and hotels in Rosthwaite.

The flooding in the Eden Valley earlier in the year on April 3rd, 1962, was not particularly severe though the valley downstream of Appleby was partially inundated.

SECTION 5. DRAINAGE CHARGES.

No action has been taken by the Board under Part I of the Land Drainage Act, 1961.

SECTION 6. STATUTORY SCHEMES FOR INTERNAL DRAINAGE BOARDS.

There have been no petitions or schemes in relation to internal drainage boards under the Land Drainage Acts, 1930 and 1961.

PART V FISHERIES

1. GENERAL REPORT ON THE SALMON, TROUT & FRESHWATER FISHERIES.

1. SALMON AND SEA TROUT.

(a) RIVER EDEN DISTRICT.

Angling Season : Salmon 15th January to 14th October.
Sea Trout 1st April to 14th October.

The returns of salmon caught show a slight improvement in rod catches over the two previous seasons but are below the average for the previous five years. Apart from 1961, January catches were the lowest since 1954; February, April and May were about average but with the exception of 1953 (291) March was the lowest since 1947. Catches in September and October were well above average.

Most of the fish caught in the first six weeks of the season were taken in the lower reaches and weather conditions generally were adverse. Conditions improved somewhat during April but by early June the river was very low and weed growth was prolific. The higher waters in August and September brought increased numbers of fish and although water levels fluctuated considerably and fish were not settled sport improved until the end of the season, particularly in the upper reaches. There was however, little evidence in the Eden of the exceptional runs of grilse which were reported from many other rivers or of the heavy runs of salmon later in the season which were observed in the rest of the Board's area.

Catches by nets and fixed engines showed an appreciable decline over the previous season and were 194 fish less than the average for the previous five years. The March and April figures were well down and only May, August and September did the monthly totals exceed those of the 1961 season. July and August accounted for over 56% of the season's catch.

The number of sea trout in the river was about average and fair numbers were taken by rod and line, but catches of herling were poor.

There was a lack of water in the early part of the spawning season and, although there was a good stock of fish in the lower reaches, it was not until towards the end of November that they were able to pass into the smaller streams for spawning. It was probably the worst spawning season for some years and was aggravated by large floods, which washed out a number of redds, followed by extreme frost conditions when rivers and streams became completely frozen over and many gravel beds were frozen solid. The following is a count of the redds in the main rivers :

River Eden :

Kirkby Stephen to Warcop	...	...	...	62	
Warcop to Appleby	...	...	...	45	
Appleby to Bolton	...	...	...	48	
Bolton to Temple Sowerby	...	...	...	45	
Temple Sowerby to Langwathby	...	...	...	61	
Langwathby to Cotehill Bottom	...	...	...	48	
Cotehill to Warwick, Castle Shields, Crosby and Carlisle	...	...	...	122	
					431
River Belah	...	...	...	24	
River Scandale	...	...	...	12	
Swindale Beck	...	...	...	9	
Hilton Beck	...	...	...	12	
River Leith	...	...	...	2	
River Lyvennet	...	...	...	46	
					105

536

River Lowther :

Keld	...	...	...	...	...	16	
Bampton-Whale	...	...	...	...	...	68	
Lowther-Whale	...	...	...	...	...	71	
Swindale Valley	...	...	...	...	...	12	
Haweswater Beck	...	...	...	...	...	17	
							184

River Eamont :

Red Hill	...	...	...	...	...	16	
Sock Bridge	...	...	...	...	...	8	
Dalemain	...	...	...	...	...	70	
Pooley Bridge	...	...	...	...	...	14	
Dacre Beck	...	...	...	...	...	16	
							124

River Irthing :

River Irthing	187	
River Gelt	...	...	...	...	...	17	
River King	...	...	...	...	...	43	
							247
River Petteril	...	...	...	...	...	...	11
River Caldew	...	...	...	...	...	...	18
							584
							1,120

The number of season salmon rod licences (exclusive of general licences) increased from 399 (1961) to 407 (1962) but weekly and daily licences fell from 736 (1961) to 726 (1962).

The maximum water temperatures at the North British Railway Bridge at Carlisle during the warmest period were as follows :

May 4th	59.2°F.
June 8th	65.0°F.
July 13th	66.0°F.

(b) RIVER ESK (BORDER) DISTRICT.

Angling Season : Salmon 1st February to 31st October.
Sea Trout 1st April to 30th September.

Returns of salmon caught by rod and line show the highest total for any season since records were started by the Board in 1953 but 57% of the fish were caught in September and October, when runs of fish were enormous. The early part of the season was about average and fishing was affected a good deal by adverse weather conditions. There were good runs of fish in July and August and the Liddle had a lot of salmon.

Whilst the stock of sea trout was improving by mid-June angling was not very good and there was little night fishing. Conditions improved in July and August with the largest runs of sea trout and herling for many years and catches were excellent. The upper reaches of the River Lyne fished well but the lower sections of the river were rather disappointing.

Conditions for the spawning period were very similar to the River Eden and the main rivers had an exceptional stock of fish. Although there would be losses of ova from floods and possibly from severe frozen conditions it is hoped that the net result will be satisfactory.

The number of season salmon licences fell from 67 (1961) to 58 (1962) but weekly and daily licences increased from 378 (1961) to 438 (1962).

There are no nets or fixed engines operated on the River Esk.

(c) RIVER ELLEN DISTRICT.

Angling Season :	Salmon	1st April to 31st October.
	Sea Trout	3rd April to 31st October.

At least one salmon was caught by rod and line in the River Ellen in 1962, and the runs of sea trout were better than in the previous year. A 9 lbs. sea trout was caught at Aspatria in June. There were considerable numbers of both types of fish in the river for the spawning season with many spawning beds in the upper reaches. The breach which occurred some time ago in the Netherhall Weir at Maryport permits fish to pass through without difficulty and this has, no doubt had a beneficial effect on the runs into the river.

(d) RIVER DERWENT DISTRICT.

Angling Season :	Salmon	1st April to 31st October.
	Sea Trout	3rd April to 31st October.

Salmon catches in April were disappointing, only five fish being shown on the licences returned, which is the lowest since 1956. May did not show much improvement but a small run of fish came into the river in the third week and some went straight through to the upper reaches, four being caught in the Keswick area on May 26th. Low water persisted through most of June but there was a rise in the last week with a fairly good run of fish and the catches for this month were the best since 1958. July was very disappointing but from then to the end of the season the anglers reaped a rich harvest. This was particularly so in the upper reaches and in the River Greta, as the high waters encouraged the fish to travel. A lot of fish were, however, caught in the middle and lower reaches and one angler had nine fish in one day near Cockermouth. There were large runs of grilse and considerable numbers were taken.

The catches for the whole season were well above average, the total being just below the all time record of 1958, but 92% of the fish were taken in the last three months of the season.

The smolt migration was the best for many years.

Sea trout angling was only fair and the view was expressed that numbers generally were declining compared to a few years ago. They were seen ascending Branthwaite Weir on the River Marron on 13th August, which was very early, and there were large runs of these fish in perfect condition in October.

The number of spawning fish was probably a record with colossal runs in the main rivers and into most tributary streams, but in the early part of the spawning season a lot of fish spawned in the main rivers because of low water. Fish were later seen further up the small becks than ever before. Several hundred salmon passed over Branthwaite Weir in the River Marron and there were large numbers of spawning redds in the Glenderamackin and St. Johns Beck. Unfortunately, the very severe frost in early 1963 resulted in most small watercourses and may spawning beds being frozen solid for several weeks. A total of 549 dead salmon kelts were removed from the rivers in this District by the end of March, 1963. Their deaths were attributed to natural causes following spawning.

The number of season salmon rod licences increased from 518 (1961) to 542 (1962) and weekly rod licences increased from 183 (1961) to 219 (1962).

The number of prosecutions for fishery offences is the lowest for many years and is accounted for, at any rate partly, by the high waters which restricted poaching activities. Details are given in Part V.

(e) SOUTH WEST CUMBERLAND DISTRICT.

Angling Season :	Salmon	1st April to 31st October.
	Sea Trout	3rd April to 31st October.

The area as a whole had the best rod catch of salmon so far recorded but, like the Derwent, the bulk of the catch was in the last three months.

There were no fresh fish reported in the Annas, Esk or Calder by the end of May and only a few in the other rivers. A rise in river levels in June brought in some fish, particularly to the Irt and Ehen, where angling improved. It was not, however, until July and onwards that good sport was enjoyed but even so this was not general.

The following are the total catches of salmon for the season on the different rivers in this District :

River Annas	105	River Irt	330	River Ehen	996
	River Esk	15	River Calder	114	

The best month on the Annas was October but in the other rivers August yielded most fish. A large number of the fish taken were grilse and on average fish were smaller than for some years. In view of the weights shown on the returns it is possible that a number of fish caught were sea trout and classed as salmon.

On 6th July there was a good run of sea trout in the River Esk but angling was poor. At this time the Irt and Ehen had fair stocks of these fish giving reasonable sport but in the Calder conditions were poor. Conditions and numbers of fish improved in July and August and in the Holmrook area of the Irt a large number of fish were taken in the middle of August. On the Irt and the Ehen it was a better than average season but on the other rivers anglers did not fare too well.

The smolt migration was very good. There were large numbers of fish in the rivers for the spawning season but their distribution between rivers was by no means uniform. Owing to low water in the early part of the season many fish spawned in the main rivers but when river levels rose considerable numbers of fish passed well up the smaller tributaries. In this area also the season was followed by severe frost conditions with frozen rivers and rock-hard spawning redds.

The number of season salmon rod licences increased from 1,124 (1961) to 1,244 (1962) and weekly rod licences increased from 653 (1961) to 759 (1962).

2. BROWN TROUT.

Angling conditions in the early part of the season were not good and cold winds with low temperatures had an effect on catches and fly life. Generally lake fishing was only moderate in these early weeks. Ullswater was fair ; there were few anglers on Ennerdale before June ; Loweswater produced some good conditioned fish with at least two of 4 lbs. and 5 lbs. ; whilst Derwentwater yielded several in the 1 lb.—2 lbs. range with one of 6 lbs.

River conditions improved with the better weather and the Eden, Petteril and Caldew fished very well with trout in extremely good condition. In the Western area the best trout river was the Ellen.

3. FRESHWATER FISH.

There are fair numbers of chub and dace in the Rivers Eden and Esk, with some grayling in the former, and most lakes have perch and pike. The Board does not issue licences for fishing for freshwater fish and as its fishery activities are directed primarily to the preservation of game fish the removal of coarse fish from the river is encouraged. The Board's bailiffs undertake this work from time to time when the population is considered to be excessive and approximately 4,000 of these fish were destroyed in 1962. Visiting anglers and clubs take fish away and a number of riparian owners have co-operated in making their waters available to these anglers.

4. FISH DISEASE AND MORTALITY.

There was much less evidence of furunculosis amongst salmon and sea trout in 1962 than in previous years. The higher water levels in July and August and the lower temperatures were no doubt of assistance in this respect. A sea trout taken from the lower Eden on 10th July, 1962, died from the disease.

In April approximately 2,000 brown trout died in Cairn Beck, a tributary of

the River Eden. These deaths arose from a discharge of sheep dip and the offender was prosecuted and convicted.

A discharge of gas liquor into the River Caldew at Carlisle caused the death of a number of fish in July.

There was some evidence that the death of a few migratory fish in the River Lyne had been caused by poison.

In June a number of trout died in Roe Beck, near Maryport, and in Mosser Beck. The reason for the former was probably silage effluent.

A considerable amount of salmon and sea trout were killed in the River Calder near Calderbridge in July and August by poachers using poison. The offenders were prosecuted and convicted.

A number of brown trout died in Hartley Beck, near Kirkby Stephen, but the cause of death was not definitely established.

At least one salmon and a considerable number of herling (kelts), brown trout and salmon parr were killed by poison in the River Eden at Carlisle on 24th February, 1963. The offenders were prosecuted and sent to prison for 3 months.

5. FISH HATCHERY AND STOCKING.

The salmon fry retained at the Hatchery in April, 1961, developed satisfactorily although growth rate was uneven and in October, 1962, it was decided to plant these fish in various tributaries of the River Eden. Plantings were made as follows:-

Crowdundle Beck	...	300	Briggle Beck	...	400
Skirwith and Blencarn Becks	300		Little Briggle Beck	...	300
Raven Beck	...	400	Lyvennet Beck	...	600

The fry retained from the 1962 crop have done very well and some have shown definite smolt characteristics.

In November, 1962, 62 female Eden salmon were caught and stripped yielding approximately 700,000 ova. A number of sea trout from the Hermitage water on the River Liddle were also stripped producing approximately 40,000 ova. In continuation of previous practice 50,000 brown trout eyed ova were purchased from a commercial hatchery. The bulk of the fry hatched will be planted in April, 1963, but a small proportion of the salmon fry will be retained at the Hatchery for rearing at least to parr stage.

The following is a summary of plantings undertaken and intended of fry from the Hatchery during its operation by the Board:

	1960 (000s)	1961 (000s)	1962 (000s)	1963 (000s)
SALMON				
<i>Eden District</i>				
Head water at Aisgill	...	15	75	—
River Belah — Oxenthwaite	...	15	75	60
Scandale Beck	...	15	75	60
Swindale Beck	...	15	75	60
Lyvennet and Tributaries	...	15	75	50
Hayber Beck	...	—	75	—
Hilton Beck	...	—	75	60
Potts Beck	...	—	75	60
Scale, Dry and Hoff Becks	...	—	100	—
Milburn Beck	...	—	25	—
Crowdundle Beck	...	—	50	—
Skirwith and Blencarn Becks	...	—	50	—
Williekeld and Little Briggle Becks	...	—	50	—
Sunnygill Beck	...	—	25	—
Hazelrigg Beck	...	—	50	—
Raven Beck	...	—	75	—

				1960 (000s)	1961 (000s)	1962 (000s)	1963 (000s)
	Dacre Beck	...	...	—	—	50	—
	Swindale (above Truss Gap)	...	...	—	—	25	—
	Kitchen Gill	...	...	—	—	—	60
	Trout Beck	...	...	—	—	—	60
	Knock Beck	...	...	—	—	—	60
	River Leith	...	...	—	—	—	60
	Upper Lowther and Tributaries	...	...	—	—	—	60
<i>South West Cumberland District</i>							
	River Irt and Tributaries	...	...	—	10	50	20
	River Ehen and Tributaries	...	...	—	10	10	10
	River Calder and Tributaries	...	...	—	—	10	20
SEA TROUT							
	River Liddle	...	...	7½	5	1	10
	River Wampool	...	...	7½	5	—	10
	River Waver	...	...	—	—	—	10
	River Ehen	...	...	—	—	—	10
BROWN TROUT							
<i>River Eden District</i>							
	Haber Beck	...	...	7½	—	7½	—
	Haweswater Feeder Streams	...	...	7½	—	—	—
	River Ive and Roe Beck	...	...	—	—	5	—
	River Belah	...	...	—	—	—	5
	River Eden above Kirkby Stephen	...	...	—	—	—	5
<i>Wampool and Waver District</i>							
	Little Waver	...	...	5	—	—	—
	Near Waverton	...	...	5	—	10	5
	River Wampool	...	...	—	—	10	5
<i>River Ellen District</i>							
	River Ellen and Tributaries	...	...	7	—	1½	10
<i>River Derwent District</i>							
	Upper Reaches and Tributaries	...	...	5	—	6	10
<i>South West Cumberland District</i>							
	River Calder	...	...	5	—	—	5

The Board appreciates the co-operation of fishery owners and lessees in allowing fish to be taken for stripping.

In addition to the 5,000 fry from the Hatchery planted in the River Ive and Roe Beck the Board negotiated a compensation payment for fish killed by pollution in 1961 and purchased 1,000 4" yearlings and 75 8"-9" brown trout which were released into these watercourses.

6. FISHERIES PROTECTION.

Mr. A. S. C. Barr, who had been the Eastern Divisional Fisheries Inspector since 1951, left the Board's employ at the end of March, 1962, and was replaced by Mr. W. Shackley.

A Divisional Inspector and seven bailiffs were employed full-time in the Eastern Division and a Divisional Inspector and six bailiffs were employed full-time in the Western Division. They were stationed as follows:

Eastern Division :

Inspector	Carlisle.
Bailiffs	Longtown, Carlisle (2), Corby Hill, Eamont Bridge, Appleby, Brough Sowerby.

Western Division :

Inspector Seaton, near Workington.
Bailiffs Holmrook, Moor Row, Camerton (2), Cockermouth,
 Keswick.

Students were again employed as temporary bailiffs from the beginning of July to early September on the Rivers Derwent and Ellen and in South West Cumberland.

The Board records its appreciation of the services rendered by honorary bailiffs.

The total number of offences reported during the year was 127. These were dealt with as follows :

<i>District</i>	<i>Prosecution</i>	<i>Warning</i>	<i>No Action</i>
River Esk 	5	—	—
River Eden 	31	12	9
River Ellen 	7	2	8
River Derwent 	15	8	3
South West Cumberland	11	11	5

7. COMMITTEE ON SCOTTISH SALMON AND TROUT FISHERIES.

The Board was asked by this Committee if it wished to submit any evidence or views for consideration. A reply was sent directing attention to the stake nets on the Scottish shore of the Solway ; the difference in minimum size of mesh of nets as between England and Scotland ; lack of uniformity in legislation, including weekly and annual close seasons ; and the dangers of drift netting.

8. DRIFT NETTING.

A certain amount of hang netting for salmon is undertaken in the Solway Firth and, having in mind the Regulations made under the Sea Fish Industry Acts, the Board was concerned that the restrictions imposed on other areas might lead some of the drift netters to move to the Solway. The Board made an Order limiting the number of licences to be issued for drift or hang nets in public waters to four and the Minister confirmed the Order on 29th January, 1963.

9. BYELAWS.

The byelaw relating to mesh sizes of Haaf Nets in the Solway, to which reference was made in last year's Report was confirmed by the Ministry of Agriculture, Fisheries and Food.

A review of the Board's fishery byelaws was undertaken in 1962 but in view of the provisions in the Water Resources Bill it was decided to defer action.

10. MANCHESTER CORPORATION WATERWORKS.

Following the decision of the House of Lords on 8th February, 1962, to delete the Waterworks Clauses from the Manchester Corporation's Bill, the Ministry of Housing and Local Government invited the Board, together with a number of other Authorities, to participate in an investigation into water resources in the north west. The Board accepted the invitation, having in mind particularly the fishery interests in the Rivers Eden and Eamont, and the Report of the Conference has now been published. Manchester Corporation will have to make their own choice from amongst the sources capable of yielding the water they require but the Board will continue to take all necessary action to preserve the fisheries in its area.

II. ESTIMATED NUMBER AND GROSS WEIGHT OF SALMON AND MIGRATORY TROUT CAUGHT DURING THE SEASON.

<i>Salmon</i>			<i>Migratory Trout</i>	
	<i>No.</i>	<i>Weight</i>	<i>No.</i>	<i>Weight</i>
(a) With Nets and Fixed Engines	2,307	22,305 lb.	Not known	
(b) With Rod and Line ...	5,608	54,710 lb.	Not known	
Total number of Salmon Licences Issued ...			4,622	
Number of Returns received :				
Returns showing fish taken ...			1,264	
'Nil' Returns ...			1,639	

III. LICENCES ISSUED

Description of Licence				Salmon			Trout and Char						
				No. Issued	Rate			No. Issued	Rate				
					£	s.	d.			£	s.	d.	
WHOLE AREA													
Rod and Line ... S.				25	10	10	0	S.	71	2	0	0	
RIVER ESK (BORDER) DISTRICT													
(a) Rod and Line ... S.				58	5	0	0	S.	294	1	0	0	
				7.D.	24	1	15	0	7.D.	111	7	6	
				1.D.	414	10	0	S.J.	63	5	0		
								1.D.	629	2	6		
(b) General Licences S.				1	37	10	0						
				S.	1	20	0	0					
RIVER EDEN DISTRICT													
(a) Instruments other than Rod and Line, viz :—													
Coops ... S.				3	50	0	0						
Draft Nets S.				4	40	0	0						
Hang Nets ... S.				2	25	0	0						
Haaf Nets ... S.				177	5	5	0						
(b) Rod and Line ... S.				109	7	0	0	S.	2,514	1	0	0	
				S.	298	4	0	0	7.D.	1,552	7	6	
				7.D.	118	2	10	0	S.J.	1,160	5	0	
				1.D.	610	15	0	1.D.	4,770	2	6		
(c) General Licences ... S.				1	65	0	0	S.	1	6	6	0	
				S.	1	62	6	0	S.	1	5	0	0
				S.	1	46	13	4					
				S.	1	40	0	0					
				S.	1	38	18	0					
				S.	1	35	0	0					
				S.	1	31	2	6					
				S.	1	23	6	8					
				S.	1	15	10	0					
				S.	1	5	0	0					

RIVER ELLEN AND ALLONBY BAY DISTRICT

Rod and Line ...	S.	3	1	0	0	S.	397	10	0
						7.D.	44	5	0
						S.J.	149	5	0

RIVER DERWENT DISTRICT

(a) Instruments other than Rod and Line, viz :—

Coops ...	S.	1	50	0	0				
(b) Rod and Line ...	S.	87	5	0	0	S.	338	1	0
	S.	164	4	0	0	7.D.	885	7	6
	S.	31	2	0	0	S.J.	641	5	3
	S.	259	1	10	0	1.D.	1,138	2	6
	7.D.	219	1	0	0				

SOUTH WEST CUMBERLAND DISTRICT

Trout and Char
(Other than Migratory Trout)

(a) Instruments other than Rod and Line, viz :—

Garth ...	S.	1	50	0	0				
(b) Rod and Line ...	S.	760	2	10	0	S.	90	1	0
	7.D.	759	1	0	0	7.D.	344	7	6
	S.J.	484	10	0					

S. = Season.

7.D. = Seven Day.

S.J. = Season Juvenile

1.D. = One Day.

IV. APPROXIMATE NUMBER OF MEN ENGAGED IN COMMERCIAL SALMON AND TROUT FISHING :—

Nets (of various kinds) ...	Licence Holders ...	183
	Endorsees ...	17
Fixed Engines ...	Licence Holders ...	3
	Endorsees ...	16

V. NUMBER OF PROSECUTIONS INSTITUTED DURING THE FINANCIAL YEAR WITH NATURE OF OFFENCE AND RESULT OF ACTION.

No. of Cases

Result of Action

	Fines	Adv. Fees	Other
	£ s. d.	£ s. d.	

RIVER ESK (BORDER) DISTRICT

5 Fishing with unlicensed instrument	11	0	0	9	4	0
--------------------------------------	----	---	---	---	---	---

RIVER EDEN DISTRICT

14 Fishing with unlicensed instrument	7	10	0	21	0	0	(6) Conditional Discharges
	—	—	—	6	6	0	(3) Withdrawn
5 Ground baiting ...	8	10	0	4	4	0	
3 Fishing with prohibited bait	4	10	0	—	—	—	
2 Grappling for trout ...	—	—	—	—	—	—	(2) Dismissed

1	Causing watercourse to be poisonous to fish (sheep dip)	5	0	0	6	6	0	
2	Using poison with intent to take or kill fish	—	—	—	—	—	—	(2) 3 m'ths. imprisonment
2	Killing unclean or immature fish	—	—	—	—	—	—	(2) Conditional discharges
2	Killing salmon or trout during annual close season	—	—	—	—	—	—	(2) Conditional discharges

RIVER ELLEN AND ALLONBY BAY DISTRICT

2	Taking trout of less than 8" in length	4	0	0	4	4	0	
2	Attempting to take fish by hands	—	—	—	—	—	—	(2) Dismissed
2	Refusing to give name & address	4	0	0	2	2	0	
1	Fishing with unlicensed instrument	—	—	—	—	—	—	(1) Dismissed

RIVER DERWENT DISTRICT

9	Fishing with unlicensed instrument	35	0	0	16	16	0	
1	Fishing with prohibited bait	1	0	0	1	1	0	
1	Giving false address ...	20	0	0	1	1	0	
1	In possession of unclean salmon	5	0	0	2	2	0	
2	In possession of illegal instrument.	10	0	0	4	4	0	(1) Dismissed
1	Aiding and abetting use of illegal instrument. ...	5	0	0	—	—	—	

SOUTH WEST CUMBERLAND DISTRICT

10	Fishing with unlicensed instrument	8	0	0	6	6	0	
		—	—	—	5	5	0	(5) Conditional discharges
1	Fishing with two rods ...	1	0	0	2	2	0	
		<hr/>			<hr/>			
		£129 10 0			£92 3 0			
		<hr/>			<hr/>			

VI.

(a)	Total Annual Value of Assessed Fisheries	...	...	£611 10 0
(b)	Rate in the £ imposed by the Board	...	...	Nil

APPENDIX I.

RETURNS OF SALMON CAUGHT

(a) RIVER EDEN DISTRICT

(i) Rod and Line

SALMON

<i>Year</i>	<i>Jan.</i>	<i>Feb.</i>	<i>March</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>August</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Total No.</i>	<i>Total Weight</i>	<i>Average Weight</i>
1941	28	94	248	160	99	53	9	6	10	19	726	11,008 lb.	15.15 lb.
1942	60	238	323	263	134	54	8	4	18	37	1,139	19,238 lb.	16.89 lb.
1943	84	238	145	217	163	53	59	60	70	43	1,132	17,933 lb.	15.84 lb.
1944	83	268	298	284	107	43	26	5	34	55	1,203	17,735 lb.	14.74 lb.
1945	35	228	267	147	95	45	13	4	21	19	874	13,737 lb.	15.72 lb.
1946	20	113	189	105	33	19	17	3	25	56	580	8,735 lb.	15.06 lb.
1947	53	61	120	317	229	55	32	10	19	45	941	13,809 lb.	14.68 lb.
1948	115	290	296	414	194	91	95	36	102	73	1,706	24,151 lb.	14.16 lb.
1949	94	267	519	415	165	68	23	16	8	5	1,580	26,807 lb.	16.97 lb.
1950	96	276	329	323	203	38	17	12	21	20	1,335	19,576 lb.	14.66 lb.
1951	103	281	319	407	261	55	30	18	50	22	1,546	24,593 lb.	15.91 lb.
1952	110	304	394	331	169	66	24	28	56	83	1,565	22,679 lb.	14.49 lb.
1953	78	244	291	306	128	58	22	37	46	—	1,210	17,834 lb.	14.74 lb.
1954	114	224	503	383	252	109	58	52	76	—	1,771	23,867 lb.	13.48 lb.
1955	177	402	471	365	320	62	26	25	72	—	1,920	28,629 lb.	14.91 lb.
1956	166	200	394	244	182	65	35	49	154	—	1,489	20,236 lb.	13.58 lb.
1957	220	485	533	327	196	41	40	61	136	55	2,094	27,228 lb.	13.00 lb.
1958	193	383	373	315	278	97	52	64	81	38	1,874	24,411 lb.	13.03 lb.
1959	195	331	531	372	227	52	23	12	30	26	1,799	23,784 lb.	13.22 lb.
1960	211	317	410	283	118	26	23	58	69	104	1,619	22,525 lb.	13.91 lb.
1961	153	361	387	272	147	36	31	37	73	38	1,535	20,165 lb.	13.14 lb.
1962	164	346	291	327	198	43	33	55	130	95	1,682	23,559 lb.	14.00 lb.

RETURNS OF SALMON CAUGHT—continued

RIVER EDEN DISTRICT

(ii) Nets and Fixed Engines.

SALMON

(Exclusive of Haaf Nets up to and including 1955)

<i>Year</i>	<i>Feb.</i>	<i>March</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>August</i>	<i>Sept.</i>	<i>Total No.</i>	<i>Total Weight</i>	<i>Average Weight</i>
1941	75	72	75	143	83	189	272	—	909	12,181 lb.	13.40 lb.
1942	144	151	234	318	77	150	101	—	1,175	16,318 lb.	13.89 lb.
1943	93	264	199	39	57	124	180	—	956	13,103 lb.	13.71 lb.
1944	130	223	200	132	91	85	181	—	1,042	13,966 lb.	13.40 lb.
1945	96	191	57	106	28	81	131	—	690	9,308 lb.	13.49 lb.
1946	56	135	168	168	60	83	75	—	745	9,347 lb.	12.55 lb.
1947	15	18	67	98	69	145	369	—	781	8,179 lb.	10.47 lb.
1948	71	155	124	151	154	243	178	—	1,076	13,855 lb.	12.88 lb.
1949	319	133	107	137	136	287	178	—	1,297	17,125 lb.	13.20 lb.
1950	51	64	55	93	223	128	75	—	689	8,012 lb.	11.63 lb.
1951	55	76	101	87	105	192	186	—	802	9,258 lb.	11.88 lb.
1952	123	103	155	118	151	389	168	—	1,207	13,468 lb.	11.16 lb.
1953	94	66	100	131	171	234	131	—	927	10,394 lb.	11.21 lb.
1954	102	142	221	141	90	200	63	—	959	10,891 lb.	11.36 lb.
1955	68	109	196	107	135	440	491	—	1,546	15,930 lb.	10.30 lb.
1956	104	194	183	221	334	534	151	9	1,730	19,398 lb.	11.21 lb.
1957	73	107	145	177	393	317	338	7	1,557	14,950 lb.	9.60 lb.
1958	98	127	193	183	213	391	378	18	1,601	16,744 lb.	10.46 lb.
1959	340	169	189	316	343	383	830	22	2,592	28,408 lb.	10.96 lb.
1960	33	69	206	253	285	465	640	30	1,981	20,422 lb.	10.31 lb.
1961	84	246	123	158	435	710	483	33	2,272	24,872 lb.	10.95 lb.
1962	69	98	84	178	324	507	512	34	1,806	18,639 lb.	10.32 lb.

RETURNS OF SALMON CAUGHT—continued

(b) RIVER ESK (BORDER) DISTRICT (To Scottish Border only)

(i) Rod and Line

SALMON

<i>Year</i>	<i>February</i>	<i>March</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>August</i>	<i>Sept.</i>	<i>October</i>	<i>Total No.</i>	<i>Total Weight</i>	<i>Average Weight</i>
1953	13	22	27	16	4	6	12	20	27	147	1,948 lb.	13.25 lb.
1954	27	75	40	26	8	8	9	18	30	241	2,982 lb.	12.37 lb.
1955	43	102	55	23	6	2	—	11	99	341	4,730 lb.	13.87 lb.
1956	8	17	19	23	5	5	18	47	76	218	2,708 lb.	12.42 lb.
1957	38	41	40	17	9	15	28	98	73	359	3,778 lb.	10.52 lb.
1958	62	62	41	36	11	7	29	39	66	353	4,166 lb.	11.80 lb.
1959	31	70	36	32	4	11	4	26	84	298	3,652 lb.	12.26 lb.
1960	24	55	42	16	14	14	23	56	66	310	3,596 lb.	11.60 lb.
1961	41	29	32	23	9	9	14	30	43	230	2,989 lb.	12.99 lb.
1962	30	27	27	32	10	15	30	115	113	399	4,533 lb.	11.36 lb.

(ii) Nets and Fixed Engines.

SALMON

<i>Year</i>	<i>February</i>	<i>March</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>August</i>	<i>Total No.</i>	<i>Total Weight</i>	<i>Average Weight</i>
1954	9	20	12	46	45	31	3	166	1,997 lb.	12.03 lb.
1955	9	3	17	6	11	47	37	130	1,141 lb.	8.77 lb.
1956	—	—	—	—	—	—	—	—	—	—
1957	—	—	—	—	—	—	—	—	—	—
1958	—	—	—	—	—	—	—	—	—	—
1959	—	—	—	—	—	—	—	—	—	—
1960	—	—	—	—	—	—	—	—	—	—
1961	—	—	—	—	—	—	—	—	—	—
1962	—	—	—	—	—	—	—	—	—	—

RETURNS OF SALMON CAUGHT—continued

(c) RIVER DERWENT DISTRICT

(i) Rod and Line

SALMON

Year	April	May	June	July	August	Sept.	October	Nov.	Total No.	Total Weight	Average Weight
1950	—	7	6	81	165	137	142	29	567	—	—
1951	4	8	4	93	152	183	86	15	545	—	—
1952	14	15	37	140	200	123	223	76	828	8,405 lb.	10.15 lb.
1953	5	10	20	168	153	201	215	—	772	7,540 lb.	9.76 lb.
1954	14	9	90	213	337	329	190	—	1,182	12,317 lb.	10.42 lb.
1955	8	19	47	63	14	192	425	—	768	6,074 lb.	7.91 lb.
1956	3	16	18	129	604	468	512	—	1,750	15,996 lb.	9.14 lb.
1957	7	16	18	135	445	541	257	—	1,419	11,119 lb.	7.84 lb.
1958	14	45	60	145	521	603	588	—	1,976	17,981 lb.	9.10 lb.
1959	14	29	22	54	35	33	320	—	507	4,732 lb.	9.33 lb.
1960	21	9	23	116	227	406	369	—	1,171	9,618 lb.	8.21 lb.
1961	10	20	32	205	220	237	302	—	1,026	10,260 lb.	10.00 lb.
1962	5	18	43	86	630	639	546	—	1,967	15,825 lb.	8.45 lb.

SALMON

(ii) Nets and Fixed Engines.

1953 Total Number	— 296 ;	Total Weight	2,716 lb.
1954 Total Number	— 311 ;	Total Weight	2,555 lb.
1955 Total Number	— 112 ;	Total Weight	1,059 lb.
1956 Total Number	— 229 ;	Total Weight	2,330 lb.
1957 Total Number	— 402 ;	Total Weight	2,717 lb.
1958 Total Number	— 662 ;	Total Weight	6,262 lb.
1959 Total Number	— 574 ;	Total Weight	5,506 lb.
1960 Total Number	— 438 ;	Total Weight	3,684 lb.
1961 Total Number	— 148 ;	Total Weight	1,450 lb.
1962 Total Number	— 423 ;	Total Weight	2,910 lb.

RETURNS OF SALMON CAUGHT—continued

(d) SOUTH WEST CUMBERLAND DISTRICT

(i) Rod and Line

SALMON

<i>Year</i>	<i>April</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>August</i>	<i>September</i>	<i>October</i>	<i>Total No.</i>	<i>Total Weight</i>	<i>Average Weight</i>
1953	—	—	5	69	105	91	35	305	2,213 lb.	7.25 lb.
1954	—	—	20	34	64	54	57	229	1,833 lb.	8.00 lb.
1955	—	2	7	19	20	42	56	146	1,052 lb.	7.20 lb.
1956	1	—	8	58	172	99	55	393	2,755 lb.	7.00 lb.
1957	1	2	11	116	181	219	88	618	4,025 lb.	6.51 lb.
1958	4	13	49	170	391	367	303	1,297	9,063 lb.	7.00 lb.
1959	1	7	29	69	52	120	182	460	3,641 lb.	7.91 lb.
1960	1	1	29	84	163	140	81	499	3,676 lb.	7.37 lb.
1961	5	17	57	99	154	77	108	517	3,827 lb.	7.40 lb.
1962	4	12	45	191	653	416	239	1,560	10,793 lb.	6.92 lb.

(ii) Nets and Fixed Engines.

SALMON

1953 Total Number	— 29;	Total Weight	254 lb.
1954 Total Number	— 18;	Total Weight	149 lb.
1955 Total Number	— 83;	Total Weight	555 lb.
1956 Total Number	— 36;	Total Weight	196 lb.
1957 Total Number	— 237;	Total Weight	1,135 lb.
1958 Total Number	— 144;	Total Weight	679 lb.
1959 Total Number	— 183;	Total Weight	1,098 lb.
1960 Total Number	— 90;	Total Weight	570 lb.
1961 Total Number	— 36;	Total Weight	327 lb.
1962 Total Number	— 78;	Total Weight	756 lb.

PART VI

PREVENTION OF POLLUTION

SECTION 1. QUALITY OF WATER.

(i) APPRECIATION OF QUALITY OF WATER IN RIVERS.

1. GENERAL.

The Cumberland River Board area has large areas of uplands which are often mountainous, lakes, and swift flowing rivers ; the only extensive area of lowland is that of the Solway Plain to the west of Carlisle. The results of these topographical features are rivers of relatively steep gradients and with considerable variations of flow. Urban areas are not numerous and except for Carlisle and the coast towns of Whitehaven and Workington, not large. Industries are mainly concentrated in Carlisle or in West Cumberland where trade effluents are discharged into the sea.

The natural purity of the waters and in particular their value as fishing rivers makes it necessary to keep a close watch on even small discharges of polluting effluent.

2. RIVER EDEN & ITS TRIBUTARIES.

The River Eden is the longest of the rivers in the Cumberland River Board area having 70 miles from its source in Mallerstang Common to its outfall into the Solway Firth. It has as main tributaries the Lowther and the Eamont flowing from the Lakeland area, the Irthing from the upland area north-east of Carlisle and the Caldew and Petteril flowing north to join the main river in Carlisle.

Over most of these lengths of the Eden and its tributaries the quality of the water is of satisfactory standard and varies little throughout the year. As more attention is being given to rural sewage disposal, isolated lengths of lower quality water are being eliminated. As would be expected, the main sources of pollution are in the Carlisle area. Here the Willowholme Sewage Disposal Works of Carlisle Corporation discharge a large volume of effluent which does not always reach as high a standard as could be desired. There are also a number of discharges of trade effluent which affect the River Caldew within Carlisle.

3. RIVER ESK (BORDER) AND RIVER LYNE.

The quality of water is generally good and there has been little change during the past twelve months.

4. RIVER DERWENT AND ITS TRIBUTARIES.

The River Derwent flowing from the centre of the Lakeland Mountains has in its upper reaches water of an exceptionally high quality. There is some pollution at times from the sewage disposal works of Keswick Urban District Council but it is hoped that proposed modifications and extensions will remedy this. There are also other small sources of pollution but the effects are usually only local and a reasonable quality of water is maintained to its outfall.

The River Greta, joining the main stream at Keswick, together with the River Glenderamackin and the St. John's Beck from Thirlmere, have water of good quality. The River Cocker flowing from Crummock Water to join the River Derwent at Cockermouth is fast flowing, free from pollution and with water of a high standard of purity.

5. NORTH WEST CUMBERLAND RIVERS.

All these rivers, and in particular the lower lengths of the River Waver and Wampool, are more slow flowing and often carry a fair load of material in suspension ; the rate of recovery from any pollution is also slower. There are, however, few serious sources of pollution though the River Ellen suffers from the discharge of the Sewage Disposal Works at Aspatria. Generally speaking water quality is lower here than elsewhere in the area.

6. SOUTH WEST CUMBERLAND RIVERS.

In the north of this area there is still serious pollution of the lower length of the river Ehen and its tributary, the River Keekle, mainly from the Sewage Disposal Works at Cleator and Cleator Moor. This results in a water of low quality. The upper lengths of the River Ehen and the principal rivers further south, such as the Calder, the Irt, the Esk and the Annas, all have water of high quality.

(ii) SAMPLING OF WATER IN RIVERS.

This sampling has almost entirely been confined to these lengths of rivers and streams where pollution was evident and to provide evidence of the effect of such pollution on the quality of water in such rivers and streams. Some 25 samples have been so taken with values of B.O.D. from 5 p.p.m. to 48 p.p.m. and amounts of suspended solids from 19 p.p.m. to 379 p.p.m.

SECTION 2. STANDARDS APPLIED TO EFFLUENTS.

- (a) From Sewage Disposal Works providing settlement tank, filter and humus tank treatment :—
 - 1. The biochemical oxygen demand, five days at 20°C, shall not exceed 20 p.p.m.
 - 2. The solids in suspension, dried at 105°C, shall not exceed 30 p.p.m.
 - 3. The effluent shall pass the methylene blue stability test (5 days at 20°C).
 - 4. The pH value shall be between 5.0 and 9.0.
- (b) From Storm Water Overflows :—
 - 1. There shall be no discharge until the flow in the sewer exceeds 6 times the dry weather flow.
 - 2. There shall be no discharge of gross solids.
- (c) From Storm Water Tanks at Sewage Disposal Works :—
 - 1. There shall be no discharge until at least 3 times dry weather flow is being given full treatment.
 - 2. The solids in suspension, dried at 105°C, shall not exceed 100 p.p.m.
- (d) From Single Houses :—
 - 1. Wherever possible the effluent shall be taken into the public sewer.
 - 2. If discharge into the public sewer is impossible treatment should be by means of a suitable septic tank and, where ground conditions permit, a filter.
 - 3. The biochemical oxygen demand, five days at 20°C shall not exceed 20 p.p.m.
 - 4. The solids in suspension, dried at 105°C shall not exceed 30 p.p.m.
 - 5. The pH value shall be between 5.0 and 9.0.
- (e) For Trade Effluents :—
 - 1. Trade effluents should be discharged to the public sewer wherever possible.
 - 2. Volumes, rates of flow and temperature, to be determined individually, depending upon dilution, etc., available.
 - 3. As a general rule no oil discharge shall be allowed.
 - 4. With wash-waters, etc., the proportion of solids in suspension shall be determined with regard to effect on the stream into which the discharge is to be made.
 - 5. Limiting conditions for toxic substances to be determined for each individual discharge.

SECTION 3. SAMPLES AND ANALYSIS OF EFFLUENTS.

(i) The Board does not maintain its own laboratory. Analysis of samples have been undertaken by the Public Analyst or by the Solway River Purification Board in their Dumfries Laboratory. During the year 45 samples have been the subject of analysis.

(ii) Twelve samples of final effluents from sewage disposal works were analysed and were classified as follows :—

3 as satisfactory (B.O.D. 30 p.p.m. and suspended solids less than 40 p.p.m.).
5 as unsatisfactory (B.O.D. exceeding 40 p.p.m. and suspended solids exceeding 50 p.p.m.).

4 as bad (B.O.D. exceeding 100 p.p.m. and suspended solids exceeding 60 p.p.m.)

Six samples of trade effluents were analysed and classified as follows :—

1 as satisfactory (B.O.D. 30 p.p.m.).

3 as unsatisfactory (2 because of high B.O.D. and 1 because of presence of phenol).

2 as bad (because of high B.O.D.).

SECTION 4. SEWAGE AND TRADE EFFLUENTS.

There has been a slow but appreciable improvement in the local authority sewage disposal in the rural areas. Alterations and reconstructions have been carried out at a number of different sewage works, the construction of one new sewage works has been commenced and the new works at Longtown has been brought into use.

A new disposal works at Dalston near Carlisle, which also deals with a considerable volume of trade waste from a Milk Factory, has given trouble with a discharge of effluent into the River Caldew well below the standards set by the Board. The Board has strongly protested about this and the Border Rural District Council is also very concerned. Proposed alterations will, it is hoped, produce a much need improvement.

There is still serious pollution from the sewage disposal works of the Ennerdale Rural District Council at Cleator and Cleator Moor ; the delay in providing new sewage works is a matter of some disappointment.

There has been some improvement in the discharge of trade waste into the River Caldew at Carlisle and it is expected that one bad discharge will be completely eliminated by taking the trade waste into the sewer.

At the Willow Holme Sewage Disposal Works of Carlisle Corporation, large scale reconstruction of the primary sedimentation tanks and the construction of storm tanks has resulted in a reduction in the flow that can be accepted into the works and also in the quality of the final effluent by the fact that less capacity for settlement is available. From time to time there have been discharges of crude sewage ; this and the lower standard of quality of the final effluent has caused pollution of the River Eden. It is, however, expected that by the early autumn these reconstruction works will have been completed.

In the period of twelve months ending 31st March, 1963, the Board issued consents under Section 7(7) of the Rivers (Prevention of Pollution) Act, 1951 for

- (a) 9 new discharges from Septic Tanks in Rural Areas.
- (b) 9 new discharges from Local Authority Sewage Disposal Works.
- (c) 5 new discharges from Local Authority Storm Overflows.
- (d) 1 new discharge of trade effluent (wash water from filters).

SECTION 5. REMEDIAL ACTION.

The Board has been concerned to improve the quality of those discharges of sewage and trade effluent which continue to affect the generally high quality of river water in the area.

The local Authorities have made progress with new works both in construction and in planning. But more could be done, and in some cases there is long delay between decision to carry out improvements and actually getting the work done.

There has been no necessity to take legal action during the year under review.

SECTION 6. RESEARCH.

No research has been undertaken during the twelve months.

PART VII

OTHER GENERAL INFORMATION

1. RIVER BOARDS' ASSOCIATION ANNUAL CONFERENCE.

At the invitation of the Board the Tenth Annual Conference of the River Boards' Association was held at Keswick from 2nd to 4th May, 1962, when 151 delegates, together with 67 guests, attended.

Delegates and guests were received by the Chairman of the Keswick Urban District Council (Councillor T. Harden) and the President and Lady Heneage at a Civic Reception at the Royal Oak Hotel. The Chairman of the Board replied to the Presidential Address.

The Board's Engineer presented a Paper on "The Influence of Topography on Land Drainage as experienced in the Area of the Cumberland River Board" and which was illustrated by colour slides. Mr. A. Gerard Boulton, Engineer in Charge, Surface Water Survey of the Ministry of Housing and Local Government, submitted a Paper on "The Bearing of Hydrology on Water Conservation" and Captain J. de B. Stansfeld presented a Paper on "The Relationship between Drift Net Fishing for Salmon and Established Salmon Fishing". The discussion on this latter Paper was opened by Mr. P. J. Liddell, a member of the Board.

The texts of these Papers, together with a Report on the discussions, are included in the Association's Year Book for 1962.

On the Thursday and Friday afternoons there were tours of inspection of the Board's area and also a visit to the Laboratory of the Freshwater Biological Association at Ferry House, Windermere, by kind invitation of the Director, Mr. H. C. Gilson. The Ladies were also taken for a motor launch tour of Derwentwater. Fortunately the weather was ideal and delegates and guests were able to enjoy the full beauty of Lakeland.

Conference concluded with the Annual Dinner at which the Rt. Hon. the Earl of Jellicoe, D.S.O., M.C., Joint Parliamentary Secretary to the Ministry of Housing and Local Government (as he then was), was the principal guest speaker.

It was generally acknowledged as being one of the most successful of the Association's Conferences.

2. WATER RESOURCES BILL.

In April, 1962, the White Paper on "Water Conservation England and Wales" was presented to Parliament. Amongst the Government's proposals was the formation of a new river authority area by combining the Cumberland River Board area with part of the Lancashire River Board area. The remainder of the latter area was to be joined with the Mersey and Cheshire River Board areas. The boundaries of the new areas were not settled at the time of publication of the White Paper.

The Board accepted that some extension of its area would be logical in view of the additional functions to be undertaken by the proposed new river authorities and representations were made to the Ministry that the southern boundary of the new area should be drawn to include the whole of the Lake District and the River Lune catchment area. The Board was strongly of opinion that the area to the south of this line should be excluded.

The Water Resources Bill, introduced in the House of Lords in November, 1962, departed from the White Paper proposals in that the Bill provided for the amalgamation of the whole of both the Cumberland and Lancashire River Board areas to form one new area.

The Board opposed this amalgamation and was supported in this opposition by the Cumberland County Council. Representations were made to the Ministries and a number of Members of the House of Lords were informed of the Board's views. Lord Henley moved two amendments to the Bill during its passage through that House; the first was on the basis of what the Board had suggested and the second, which the Board fully supported, was for a Lakeland River Authority area. Neither amendment was accepted by the Government and the Bill, so far as this amalgamation was concerned, went to the House of Commons in its original form. Opposition to the amalgamation will be pursued by the Board in that House.

The Board wishes to record its appreciation of the support which it has been given in this matter.

PART VIII

INFORMATION ABOUT EXPENDITURE AND INCOME

(Issued subject to audit)

PART VIII: INFORMATION

Statement of Income and Expenditure on Loan

Table 1

	Revenue Account £	Loan Account £	Grand Total £
EXPENDITURE			
LAND DRAINAGE AND WATER GAUGING :			
Capital Transactions :—			
Grant Aided Works, etc. (For details see Table 2)	13,192		13,192
Non-Grant Aided Works, etc. (For details see Table 2)	5,931		5,931
	<hr/> 19,123	<hr/>	<hr/> 19,123
 Revenue Transactions —			
New Works & Imp. Schemes—			
Loan Charges—			
Principal Repaid	14,030		
Interest	7,282		21,312
Maintenance of Works—			
Watercourses	28,517		
Water Gauging	95		28,612
Contributions to Internal Drainage Boards	—		—
Subsidiary Accounts—			
Motor Transport & Plant—			
Maintenance & Operating Costs	£ 6,242		
Carried forward	<hr/> 6,242	<hr/>	<hr/> 69,047

ABOUT EXPENDITURE AND INCOME

and Revenue Accounts — Year ended 31st March, 1963.

	Revenue Account £	Loan Account £	Grand Total £
INCOME			
LAND DRAINAGE AND WATER GAUGING :			
Capital Transactions :—			
Grant Aided Works—			
Loan Raised		—	—
Contributions from Local Authys., Private Frontages, etc.	1,300		1,300
Exchequer Grant—Schemes financed from Revenue	8,408		8,408
Non-Grant Aided Works—			
Sale of Motor Vehicles and Heavy Plant	937		937
	<u>10,645</u>	—	<u>10,645</u>
Revenue Transactions —			
New Works & Impt. Schemes—			
Exchequer Grants towards Loan Charges	15,333		15,333
Maintenance of Works—			
Contr. from Local Authys., Private Frontages, etc.	330		330
Administrative Charges—			
Apportioned to and included in Capital Expenditure and Subsidiary Revenue Accounts—			
Pollution Prevention	600		600
Rechargeable to :—			
Fisheries—Hatchery	50		50
Carried forward	<u>26,958</u>	—	<u>26,958</u>

Statement of Income and Expenditure on Loan

Table 1—

				Revenue Account £	Loan Account £	Grand Total £
EXPENDITURE						
Brought forward	...	6,242		69,047		69,047
Loan Charges—						
Principal	...	...	...	1,222		
Interest	...	...	...	163		
Debit Balance on Stores Account	...	38				
				<u>7,665</u>		
Deduct—						
Motor Transport & Plant—						
Hiring Charges	...	...	9,975			
Credit Balance—						
Light Plant, Tools & Equipment			86			
Oncost	...	...	127			
Stores Oncost	...	...	65			
Rebate on Purchases	...	...	19			
				<u>10,272</u>	Cr. 2,607	Cr. 2,607
Estates—						
Rent, Rates & Ins.	£233)				
Repairs & Renewals	£283)				
				516		516
Administrative Charges—						
Staff Salaries, Insurance & Superannuation				9,846		
Travelling, Subsistence, etc.	...	...		1,523		
Office Accommodation	...	...		—
Office Expenses—Engineer's Requisites	...			53		
Other Items	...	...		34		
Proportion of General Administrative Charges				6,801		18,257
General Charges	...	...	...	277		277
Other Items—Main River Survey	...	...		35		35
Total—LAND DRAINAGE &						
WATER GAUGING		<u>85,525</u>		<u>85,525</u>
Carried forward		<u>85,525</u>		<u>85,525</u>

—continued.

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Statement of Income and Expenditure on Loan

Table 1—

	Revenue Account £	Loan Account £	Grand Total £
EXPENDITURE			
Brought forward	85,525		85,525
FISHERIES :			
Capital Transactions :—			
Non-Grant Aided Works (for details see Table 2)	823		823
	<hr/> 823		<hr/> 823
Revenue Transactions —			
Hatchery	390		390
Water Bailiffs & Inspectorate—			
Wages, Nat. Ins. & Superan.	10,959		
Travelling, Subsistence, etc.	382		
Cottages—Rents £96)			
Repairs £59)			
	155		
Interview Expenses & Medical Exams.	4		
Requisites	56		
Transport—Maintenance & Operating Costs	857		12,413
Maintenance & Development of Fisheries—			
Removal of Shoal £34)			
Other £86)			
	120		120
Administrative Charges—			
Office Expenses—			
Postages £159 ; Printing, Stationery & Advertising £126; Telephones £60			
	345		345
Legal & Parliamentary Expenses, etc.—			
Prosecutions	212		212
Carried forward	<hr/> 14,303		<hr/> 14,303
Carried forward	85,525		85,525

and Revenue Accounts — continued.

—continued.

			Revenue Account £	Loan Account £	Grand Total £
INCOME					
Brought forward	...	...	26,958		26,958
FISHERIES :					
Capital Transactions :—					
Non-Grant Aided Works—					
Sale of Motor Vehicle	...	...	325		325
			<u>325</u>		<u>325</u>
Revenue Transactions —					
Fishing Licences—					
Salmon & Migratory Trout	...	...	10,002		
Trout (including Migratory Trout)	...		5,793		
Trout (excluding Migratory Trout)	...		219		16,014
Administrative Charges recovered (Pollution Prev.)	...	...	100		100
Other Items—					
Bailiffs' Cottages—Rent & Rates	...		140		
Interest on Investments	...	...	203		
Penalties—Advocates' Fees, Costs, etc.	...		96		
Water Abstraction	...	...	35		
Miscellaneous	...	...	44		518
Carried forward	...	...	<u>16,957</u>		<u>16,957</u>
Carried forward	...	...	26,958		26,958

Statement of Income and Expenditure on Loan

Table 1—

				Revenue Account £	Loan Account £	Grand Total £
EXPENDITURE						
Brought forward	...	...		85,525		85,525
Brought forward	...	...		14,303		14,303
Other Items—						
Commission on Licences	...	...		595		
Insurances £45; Subscriptions £7;)						
Miscellaneous £71)						
				123		
Proportion of General Administrative Charges				2,306		3,024
General Charges	...	...	...	94		94
Other Items	...	...	...	—		—
Total—FISHERIES	...	...		17,421		17,421
POLLUTION PREVENTION :						
Capital Transactions :—						
Non-Grant Aided Works (For details see Table 2)	...	...	...	—		—
Revenue Transactions —						
Analysts' Fees	...	...	...	122		122
Administrative Charges—						
Salaries and Allowances	...	...		998		
Office Expenses	...	...	...	18		
Other Items	...	...	...	45		
Proportion of General Administrative Charges				481		1,542
Carried forward	...	...		1,664		1,664
Carried forward	...	...		102,946		102,946

and Revenue Accounts — continued.
—continued.

				Revenue Account £	Loan Account £	Grand Total £
INCOME						
Brought forward	...	...		26,958		26,958
Brought forward	...	...		16,957		16,957
Total—FISHERIES				16,957		16,957
POLLUTION PREVENTION :						
Capital Transactions :—						
Non-Grant Aided Works	...	...	...	—		—
				—		—
Revenue Transactions —						
				—		—
Carried forward	...	...		43,915		43,915
Carried forward	...	...		

Statement of Income and Expenditure on Loan

Table 1—

	Revenue Account £	Loan Account £	Grand Total £
EXPENDITURE			
Brought forward	102,946		102,946
Brought forward	1,664		1,664
General Charges	19		
Other Items :—			
Allocation of General Charges from Land Drainage & Water Gauging	600		
Allocation of Charge from Fisheries	100		719
Total—POLLUTION PREVENTION	2,383		2,383
GENERAL CHARGES :			
Subscriptions	79		
Members' Allowances & Chairman's Remuneration	659		
Insurances	31		
Audit Stamp Duty	125		
Other Items :—			
River Boards' Assoc.—			
Conference Expenses	56		
Miscellaneous	19		969
Total—GENERAL CHARGES	969		969
Carried forward	106,298		106,298

and Revenue Accounts — continued.

—continued.

				Revenue Account £	Loan Account £	Grand Total £
INCOME						
Brought forward	...	...		43,915		43,915
Brought forward	...	...		—		—
Total—POLLUTION PREVENTION				—		—
GENERAL CHARGES :						
Interest—Bank	...	...	...	471		
Assisted Car Purchase Scheme	...			56		
Rent—Land at Etterby	...	...	...	52		
Allocation to Main Services, etc.—						
Land Drainage & Water Gauging	...			277		
Fisheries	...	...	...	94		
Pollution Prevention	...	...	...	19		969
Total—GENERAL CHARGES				969		969
Carried forward	...	...		44,884		44,884

Statement of Income and Expenditure on Loan

Table 1—

	Revenue Account £	Loan Account £	Grand Total £
EXPENDITURE			
Brought forward	106,298		106,298
GENERAL ADMINISTRATIVE CHARGES (not directly allocated to Services):			
Salaries and Allowances—			
Salaries, Nat. Insurance, Superannua- tion (including equal annual charge)	7,526		
Travelling, Subsistence, etc.	181		
Office Accommodation —			
Rents & Rates £178 ; Heating, Lighting & Cleaning £515 ; Repairs, Mainte- nance & Insurance £125	818		
Loan Charges—Principal	205		
Interest	4		
Office Expenses—			
Furniture & Equipment	142		
Postages £129 ; Printing, Stationery & Advertising £531 ; Telephones £259	919		
Consulting Engineer, Legal and Parliamentary Costs	1,612		
Other Items	21		11,428
Total—GENERAL ADMINISTRATIVE CHARGES	11,428		11,428
Carried forward	117,726		117,726

—continued.

	Revenue Account £	Loan Account £	Grand Total £
INCOME			
Brought forward	44,884		44,884
GENERAL ADMINISTRATIVE CHARGES :			
Rechargeable Items—			
Recovered by percentage on cost of Rechargeable Works	165		
Charged to Internal Drainage Boards administered by the Board ...	1,675		1,840
Allocated to Main Services, etc.—			
Land Drainage & Water Gauging ...	6,801		
Fisheries	2,306		
Pollution Prevention	481		9,588
Total—GENERAL ADMINISTRATIVE CHARGES	11,428		11,428
Carried forward	56,312		56,312

Statement of Income and Expenditure on Loan

Table 1—

					Revenue Account £	Loan Account £	Grand Total £
EXPENDITURE							
Brought forward	...	...			117,726		117,726
GENERAL :							
Capital Transactions :—							
Non-Grant Aided Works (For details see Table 2)	...	...	...	...	—		—
Revenue Transactions —							
Rechargeable Works	...	...	...		1,312		1,312
Total—GENERAL	...	...			<u>1,312</u>		<u>1,312</u>
GRAND TOTALS	...	...			119,038		119,038
					<u>£119,038</u>		<u>£119,038</u>

and Revenue Accounts — continued.

—continued.

				Revenue Account £	Loan Account £	Grand Total £
INCOME						
Brought forward	...	...		56,312		56,312
GENERAL :						
Capital Transactions :—						
Non-Grant Aided Works	...	...	...	—		—
Revenue Transactions —						
Rechargeable Works	...	...	...	1,312		1,312
Precepts—						
Councils of Counties and County Bor- oughs (for details see Table 3)	...			51,691		
Internal Drainage Boards (for details see Table 3)	...	...	...	2,272		53,963
Total—GENERAL	...	...		55,275		55,275
GRAND TOTALS	...	...		111,587		111,587
BALANCE—						
Expenditure in excess of Income for the year				7,451		7,451
				<u>£119,038</u>		<u>£119,038</u>

TABLE 2.
Particulars of Transactions during the year in respect of Capital Works

Starting Date	Probable Date of Completion	Brief Description of Item	Total Estimated Cost	EXPENDITURE			LOANS RAISED		
				During year covered by Report		Total to 31st March 1963	During year covered by Report	Total to 31st March 1963	Source of Loan
		LAND DRAINAGE & WATER GAUGING—	£	Revenue £	Loan £	£	£	£	
June, 1962	June, 1963	Grant Aided Expenditure— River Eden—Bolton Willows ...	3,500	2,931	—	2,931	—	—	
Sept. 1961	June, 1962	River Lyvennet—Maulds Meaburn	2,900	306	—	2,889	—	—	
Aug. 1959	June, 1963	River Petteril—Carlisle	27,136	1,925	—	27,182	—	—	
Mar. 1962	June, 1963	River Waver— Lessonhall	7,000	7,190	—	7,483	—	—	
Mar. 1962	June, 1963	Water Gauging Stations— R. Lowther at Eamont Bridge ...	1,550	840	—	1,112	—	—	
				13,192	—		—	—	
		Non-Grant Aided Expenditure—							
		2 Vans		890	—		—	—	
		Excavator		4,628	—		—	—	
		Tractor		196	—		—	—	
		Rotovator		217	—		—	—	
				5,931	—		—	—	
		TOTAL— Land Drainage & Water Gauging		19,123	—		—	—	
		FISHERIES							
		Land Rover		823	—		—	—	
		GRAND TOTAL— Capital Expenditure		19,946	—		—	—	

TABLE 3.
PRECEPT ON COUNCILS OF COUNTIES AND COUNTY BOROUGHS AND INTERNAL DRAINAGE BOARDS

	Acreage within River Board Area	Precept Rate	Estimated Product of a Penny Rate £	Amount of Precept £
(a) County Councils :				
Cumberland	882,105	—	8,879.0	34,628
Westmorland	237,066	—	647.0	2,523
Northumberland	12,480	—	8.2	32
North Riding of Yorkshire ...	512	—	—	—
	1,132,163	—	9,534.2	37,183
County Borough Council :				
Carlisle	6,092	—	3,720.0	14,508
TOTALS	1,138,255	3.90d.	13,254.2	51,691
(b) Internal Drainage Boards :				
Allonby Bay and River Ellen ... ..	...	...	...	651
Brunstock Beck ... ..	...	...	...	108
River Marron ... ..	...	...	...	37
Upper Derwent ... ..	...	...	...	506
Waver and Wampool ... ..	...	...	...	970
GRAND TOTAL				£53,963

TABLE 4.
INCOME FROM DRAINAGE CHARGES
None.

TABLE 5.

LOAN STATEMENT

(a) Loan Raised and Repaid during the year :	£
Total loans outstanding at beginning of year—1st April, 1962.	222,346
Add—Loans raised during the year (for details see Table 2)	—
	<hr/>
	222,346
Deduct—Principal paid during the year	15,457
	<hr/>
Total loans outstanding at the end of the year—31st March, 1963	<u>£206,889</u>
(b) Sinking or Redemption Funds	None.

TABLE 6.

CONTRIBUTIONS TO INTERNAL DRAINAGE BOARDS

Nil.